Cause
Sheep scab is caused by the mite *Psoroptes ovis*; cattle are rarely affected. Mites are most commonly transmitted by direct contact with infested sheep. Sheep scab can be introduced to a flock by carrier sheep, including purchased animals, sheep returning from grazing, and strays especially on common grazing. Recently infected sheep may not show clinical signs of sheep scab, so apparently healthy introduced animals should always be considered as a potential source of infection. Exposure to mites in the environment, including contaminated fields, handling facilities, shared equipment, sheep transport and fomites on clothing can also cause disease.

The Sheep Scab (Scotland) Order 2010 requires that "a person who has possession of, or is in charge of, any sheep or carcase which the person knows or suspects has sheep scab must as soon as possible notify the Divisional Veterinary Manager as soon as possible of that knowledge or suspicion". This Order applies only in Scotland.

Economic importance
Failure to recognise and treat sheep scab promptly, or improper treatment, can incur serious economic loss due to increased feed costs to compensate for rapid loss of body condition. Low birthweights and higher mortality occur in lambs born to ewes with sheep scab during pregnancy. Slaughterhouse condemnation of carcases and downgrading of leather can further add to the economic importance of sheep scab.

Fig. 1: Sheep scab can be introduced from stray sheep - this perimeter fence is not secure.

Fig. 2: Feral sheep are a potential source of sheep scab.

Fig. 3: Sheep scab infestations causes rapid weight loss. Increased feeding to restore body condition proves expensive.
Fig. 4: Sheep scab during late pregnancy leads to lower lamb birthweights.

Clinical Signs
On a flock basis, sheep scab is characterised by intense itching, with repeated rubbing of the shoulders and flanks along the ground or against fences, foot stamping, clawing at the flanks, and biting the shoulders. Tufts of wool are characteristically seen on fences and hedges. Animals are often seen at different stages of the disease within affected flocks.

Fig. 5: Sheep scab is characterised by intense itching and biting the shoulders.

Fig. 6: Frequent nibbling at the flanks is seen in both sheep scab and louse infestations.

Fig. 7: Sheep scab is characterised by intense itching.

Fig. 8: Frequent rubbing against fences may indicate sheep scab infestation but is also commonly seen with louse infestations.
Handling of sheep with extensive scab lesions may precipitate seizure behaviour. New wool growth occurs as the disease regresses and lesions heal.

**Differential Diagnoses**

Sheep scab must be differentiated from louse infestation and necessitates veterinary examination.

**Diagnosis**

The diagnosis of sheep scab is based on the clinical signs and veterinary confirmation of *Psoroptes ovis* mites in superficial scrapings collected from the periphery of exudative lesions.
Fig. 14: Veterinary confirmation of Psoroptes ovis infestation is essential to ensure a correct diagnosis and treatment.

Fig. 15: Psoroptes ovis mite under the microscope.

Blood samples
Blood samples collected from suspect cases of sheep scab can be tested at APHA and Biobest laboratories and identify infestation before clinical signs appear.

Welfare Implications
Sheep with scab infestation can present as a serious welfare concern resulting in emaciation and extensive fleece loss in neglected cases with these consequences all too apparent (see Figs above). These concerns are aggravated during poor winter weather conditions.

Irritation and discomfort are manifest as scratching and rubbing leading to excoriation, secondary skin infections and compromised mental health.

Treatment
Treatment should be discussed with your veterinary surgeon.

Plunge dipping in organophosphorus sheep dips
Plunge dips containing dimpylate (active substance) kill scab mites within 24 hours and provided that sheep are correctly plunge dipped affords residual protection for several weeks. Plunge dipping also treats lice, blowflies, and ticks present on the host.

Macrocyclic lactone (3-ML) systemic endectocide injections
Macrocyclic lactones ( avermectins and milbemycins) given by injection can be effective against sheep scab mites, keds and sucking lice, but have no value for the control of blowflies, chewing lice, chorioptic mange or ticks. Systemic endectocides are also very valuable anthelmintics and reliance on them for sheep scab control imposes selection pressure for macrocyclic lactone resistance in nematodes. There are ongoing concerns that resistance may also be developing in scab mites to the ML group of endectocides. A recently published study has found evidence of resistance to moxidectin using in vitro assays, on four farms where persistent treatment failure had been reported. Given the similarities in their mode of action it is highly likely that cross-resistance across the ML range of compounds will be found. Where resistance is suspected, it would be unwise to repeatedly use the same treatment option and alternative treatments should be discussed with your veterinary surgeon.

It is essential that all sheep are gathered and correctly treated. Handling pens and fields should, therefore be considered as a source of re-infection for at least 17 days after removal of untreated sheep. All additional introduced animals should be treated and quarantined for sufficient time.


A list of manufacturers’ products and meat withholding products can be found at SCOPS.org.uk

Systemic endectocide injections
Two subcutaneous injections, seven days apart, of 200 µg/kg ivermectin, or a single intramuscular injection of doramectin at a dose rate of 300 µg/kg provide effective control of sheep scab. The rationale for double ivermectin injection is based on
the fact that a single injection does not consistently kill all of the mites present. While a single injection of doramectin achieves some persistence, this may occasionally be insufficient to provide protection against re-infection for the whole 17 day period during which the scab mite can survive off the sheep. A single subcutaneous injection of moxidectin at a dose rate of 200 µg/kg provides residual protection against sheep scab for at least 28 days, although the UK data sheet recommends two injections 10 days apart for the treatment of disease outbreaks. A long acting formulation of moxidectin given by a single injection at the base of the ear at a dose rate of 1mg/kg gives up to 60 days protection.

Prevention, biosecurity, and control
Sheep scab control will form an important part of your veterinary flock health plan. Prphylactic measures should be discussed with your veterinary surgeon.

Some important components of such control include:
- Maintain a closed flock wherever possible.
- Maintain secure double-fenced perimeters where they contact other fields containing sheep.
- Treat all purchased sheep upon arrival on farm and quarantine for the correct time.
- Investigate all cases of pruritus and fleece loss.

Fig. 16: Treat all purchased sheep upon arrival on farm and quarantine for the correct time.